# Enterprise 2.0 Post-Adoption: Extending the Information System Continuance Model Based on the Technology-Organization-Environment Framework

Qiong Jia
Hohai University
Nanjing City, Jiang Su Province
China 21110
Tel:+86-15268514342
E-mail: jiaqionghit@163.com

Yue Guo
Hohai University
Nanjing City, Jiang Su Province
China 21110
Tel:+86-15295781861
Email. yueggcn@aliyun.com

Stuart J. Barnes
School of Management and Business
King's College London
Franklin-Wilkins Building, 150 Stamford Street
London SE1 9NH, United Kingdom
Tel: +44 (0)20 7848 3327; Fax: +44 (0)20 7848 4639
Email: stuart.barnes@kcl.ac.uk

This paper is a post-print (final draft post-refereeing) of:
Jian, Q., Guo, Y., and Barnes, S.J. (2016). Enterprise 2.0 post-adoption: Extending the information systems continuance model based on the Technology-Organization-Environment framework, *Computers in Human Behavior*, 67, 95-105.

The publisher's version is available at:
http://dx.doi.org/10.1016/j.chb.2016.10.022

**Enterprise 2.0 Post-Adoption: Extending the Information System Continuance Model Based on the Technology-Organization-Environment Framework**


## Abstract

This paper extends the IS continuance model to improve our understanding of the determinants of E2.0 post-adoption. Our proposed research model incorporates four constructs into the IS continuance model: firm size, firm scope, subjective norms and competitive pressure from the perspective of organizational and environmental context based on the TOE framework. Results from a survey of customers of Mingdao, a leading enterprise 2.0 platform in China, supported our model. The research findings show that organizational and environmental context factors, including subjective norms and competitive pressure, significantly influence enterprises' intentions to renew their E2.0 service in addition to technology perceptions. Perceived usefulness and satisfaction are no longer the strongest predicators of continuance usage in the context of enterprise systems. The theoretical and managerial implications of these results are discussed.



**Keywords:** Post-adoption intention; Enterprise 2.0; TOE; IS continuance; Subjective norm; PLSPM.


## 1. Introduction

In recent years, Web 2.0, one of the most significant information technology innovations in the Internet Age – spearheaded by such applications as Facebook, LinkedIn, and Twitter – has rapidly permeated people's lives (Ajjan and Hartshorne, 2008; Chua and Goh, 2010; Levy, 2009; O'Reilly, 2006; Shin, 2010; Cheung et al. 2011; Chen et al. 2012; Wang et al., 2014; Cristina and Jesús-Nicasio. 2016). A growing number of business companies have begun to apply various Web 2.0 applications to support regular business operations, such as internal communication, team collaboration, project management and information sharing. However, consumer-market, individual-based Web 2.0 applications are not well suited to the enterprise context, due to such problems: compatibility, security, scalability and functionality (Dawson et al., 2009; McAfee, 2009). Correspondingly, Enterprise-level 2.0 applications (E2.0) have been designed and developed by adapting the technologies and philosophies of individual-level Web 2.0 applications to specific business requirements (e.g., Yammer, Jive, Socialcast of Chatter and Mingdao) (Leonardi et al., 2013). In this research, Enterprise 2.0 applications are defined as a set of online applications, built on the cloud computing Web 2.0 infrastructure, to help firms to improve business performance. Examples of benefits of the applications of E2.0 include rapid and agile online collaborations (Boulos et al. 2006; Miles 2009), knowledge management (Paroutis and Saleh, 2009; Zhao and Chen, 2013), and emergency response capabilities (McAfee 2006, 2009).

Compared to Web 2.0 usage in consumer markets, companies usually bear the monetary cost of E2.0 use. To leverage fully the considerable role of E2.0 in improving competitive advantages, an organization should insist on long-term use. However, a large number of E2.0 platforms still face difficult challenges in survival, owing to a low free-to-paid conversion rate (Mangiuc, 2011). There is currently little understanding of the factors influencing E2.0 post-adoption. This study focuses on the research question of why some companies continue renewing E2.0 (i.e., E2.0 continuance usage) whiles others do not. While prior studies on Web 2.0 continuance usage (e.g., Chen et al. 2012; Yoon and Rolland, 2015) can contribute to understanding the continuance of E2.0 to some degree, there is still a need for a systematic investigation and theorizing of the salient factors that influence E2.0 continuance from an enterprise rather than individual context. Compared to the continued adoption of Web 2.0 that is mainly determined by factors related to individuals' cognitive beliefs (e.g., subjective norms) and experience-specific affect (e.g., satisfaction), it is plausible that the continuance adoption of E2.0 may be viewed as an enterprise-level economic decision and should be determined by enterprise-related (e.g., firm size) as well as individual-based factors. Moreover, the significance of these individual-based factors in determining enterprise system continuance usage (i.e. E2.0 in this case) may change due to the differences between enterprise system and consumer software. For instance, the continued adoption of Web 2.0 has no financial cost to individual users while firms that use E2.0 pay a monthly or yearly enterprise license fee based on the number of users. Moreover, the implementation of E2.0 is likely to significantly influence business performance and employees' working styles from different perspectives such as communication and project management. Thus, the adoption and implementation of an enterprise system is mainly determined by the management team of a firm, particularly in small-and-medium-sized enterprises (SMEs).

Our study is arguably one of the first attempts to explore E2.0 post-adoption. With the development of cloud-based platform infrastructures, the utilization of E2.0 as a catalyst for strengthening businesses' competitive advantages has received notable attention from both academia and practitioners. According to TechNavio's analysts, the compound annual growth rate (CAGR) of E2.0 market reaches 31 percent over the period 2012-2016 and firms increase their business developmental activities through implementing E2.0 infrastructures (Research and Markets, 2013). However, existing E2.0 studies predominantly focus on describing the implementation strategy (Alqahtani and Alwadain, 2015), E2.0 functions (Paroutis and Saleh, 2009; Zhao and Chen, 2013), functions of knowledge management (Alqahtani and Alwadain, 2015; Anna Bruno, 2011; Mazumder, 2008; Louw, 2013), and challenges and risks (Kuettner et al., 2013; McAfee, 2009). Only a few studies have empirically examined initial adoption behavior toward E2.0 (e.g., Wang et al., 2014; Lin et al., 2010). Lin et al. (2010) develop a value-based adoption

model (VAM) and show that perceived benefits and perceived costs can significantly influence the value perceived by managers of adopting E2.0. However, the respondents for the study were 80 part-time MBA students rather than real E2.0 users. Wang et al. (2014) apply UTAUT to propose a research model that incorporates context-specific variables for enhancing the prediction of individuals' adoption intentions toward enterprise 2.0 applications. A professional E2.0 platform, Clearvale was used as the research context, and employees of seven companies that use the platform's trial version were invited to participate in a paper-based questionnaire. Their research findings suggest that some general information system (IS) adoption factors are still significant in the E2.0 initial adoption context including perceived usefulness and perceived ease to use.

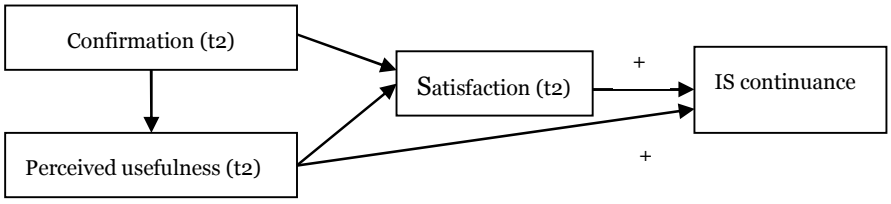
In sum, the purpose of the study is to solve this puzzle and address the question: what factors impact upon the successful continuance adoption of E2.0? Specifically, what are the factors that influence enterprises to continue purchasing E2.0 services? To disentangle this problem, it is imperative to incorporate not only technology-level factors from the IS continuance literature, but also new constructs and relationships that capture the complex nature of enterprise-level economic decisions. To fill this research gap, a conceptual model is developed by extending Bhattacherjee's (2001) IS continuance model to the E2.0 post-adoption context based on the Technology–Organization–Environment (TOE) framework (Tornatzky and Fleischer, 1990), which was originally developed for understanding enterprise-level information technology (IT) innovation adoption. This is in line with our research purpose. The TOE framework has been extensively used as a theoretical framework in prior studies of enterprise-level IS innovation, including material requirement planning (MRP) (Cooper and Zmud, 1990), electronic data interchange (EDI) (Kuan and Chau, 2001;Lacovou et al., 1995), open systems (Chau and Tam, 1997), e-commerce adoption (Gibbs and Kraemer, 2004; Hsu et al., 2006; Teo et al., 2006; Zhu et al., 2003), e-procurement (Soares-Aguiar and Palma-Dos-Reis, 2008), enterprise resource planning (ERP) (Pan and Jang, 2008), knowledge management systems (KMS) (Lee et al., 2009; Lin, 2014a) and software-as-a-service (SaaS) (Yang et al.2015). As these organizational and environmental factors are crucial to understand an enterprise's economic decision, TOE serves as an appropriate theoretical base for us to extend the IS continuance model through introducing specific context factors that are noteworthy for understanding E2.0 post-adoption.

The paper is organized as follows. Section 2 first presents the theoretical background to our study, including the conceptual model of E2.0 post-adoption, its theoretical foundation and hypotheses. The methodology is then discussed, followed by the results of testing the theoretical model. Finally, the paper rounds off with a discussion of major findings, limitations and practical implications.

## 2. Theoretical background

### *2.1 IS continuance model*

Bhattacherjee (2001) developed an IS continuance usage model adapted from the Expectation-confirmation theory (ECT) (Oliver, 1980) that has been widely used in the marketing discipline to examine the influence of consumers' satisfaction on their intention to continue using an adopted technology (Chou and Chen 2009; Lin, 2012). In the IS continuance model, IS continuance behavior is determined by two post-consumption variables including perceived usefulness and satisfaction. In order to adapt ECT to the IS continuance, Bhattacherjee (2001) makes several theoretical adaptions. First, two pre-consumption antecedents of confirmation including perceived performance and expectation are removed because Bhattacherjee (2001) proposes that their effects are captured within the confirmation and satisfaction constructs. Second, Bhattacherjee (2001) added an ex post expectation variable, perceived usefulness, because ex post expectation is especially important for IS products or services, where initial expectations often change with time. Following prior studies on IS initial adoption (e.g., Davis et al., 1989; Karahanna et al., 1999), Bhattacherjee (2001) argued that it is plausible that perceived usefulness had a constant influence on subsequent IS continuance usage decisions and thus theorizes perceived usefulness as an additional determinant of satisfaction. Third, the IS continuance model proposes that the usefulness-intention relationship originally developed by the technology acceptance model (TAM) (Davis, 1989), in the initial adoption context is also likely to exist in the continuance context because human continuance intention can be viewed as a series of usage decisions that are independent of timing or behavioral stages (Roca et. al., 2006). Thus, perceived usefulness should directly influence IS continuance intention in addition to having an indirect effect on IS continuance intention via satisfaction.




Note: t2 = post-consumption variable

**Figure 1. An Expectation-Confirmation model of IS continuance (Bhattacherjee 2001)**

### *2.2 The technology-organization-environment (TOE) framework*

The TOE framework proposes that factors determining enterprise system adoption behavior can be broadly divided into three contextual categories including technology, organizational and

environment contexts although it provides no information on what these specific factors are. First, the impact of the technological context upon enterprise system adoption behavior refers to technology-related factors that influence a firm's adoption of an innovative IS (Oliveira and Martins, 2011). Second, the organizational context emphasizes the impact of a firm's profile characteristics, resources, internal social network on its' IS adoption behavior, firm size and scope, formal and informal linking structures, internal communication, peer influence, organizational culture, the quality of human resource and so on. Third, the environmental context emphasizes that a firm's IS adoption is also significantly influenced by many external factors beyond a firm's control, such as government policies, competitors and trading partners (Tornatzky and Fleischer, 1990). Based on the TOE framework, it can effectively recognize non-technology level factors that could be neglected by prior studies on consumer software, such as external circumstance-related factors (Chau and Tam, 1997). The TOE framework is a considerably useful and adaptive framework for explaining adoption behavior toward three types of technological innovations including innovations applied for technical tasks (type 1), innovations for business administration (type 2) and innovations embedded in core business processes (type 3) (Galliers, 2007). A number of studies have shown that Web 2.0, and subsequently, Enterprise 2.0, demonstrate significant impacts upon the above three aspects, such as improving productivity (i.e., type 1) (McAfee, 2009), reducing internal communication costs (i.e., type 2) (Leonardi et al., 2013), and facilitating business process management (i.e., type 3) (e.g., Kurz and Fleischmann, 2011).

## 3. The extension of IS continuance: identifying constructs to incorporate into the IS continuance model

This section examines how this study extends the IS continuance model to the organization-level IS post-adoption context for explaining E2.0 continuance usage behavior. Building on our discussion in the introduction, here, four constructs were added to the IS continuance model and the details of the four constructs are provided. This study adopts an approach that complements the current constructs in the IS continuance model. The IS continuance model focuses on individual continuance acceptance of technology, whereas this research focuses on IS continuance usage at the organizational level. An important difference between the organizational continuance usage setting and an individual continuance usage setting and, where the IS continuance model was developed, is that firms' innovation adoption decisions usually are not only influenced by technological factors related to individuals' beliefs (e.g., perceived usefulness) but also can be determined by organizational factors and external survival context factors (i.e., environmental factors), according to the TOE framework. Within the technological context, perceived usefulness has been frequently proposed to be the most salient technology-related factor influencing IS post-adoption behavior in the IS continuance model and subsequent studies using it as a baseline model

(e.g., Thong, 2006). As a consequence, prominent factors in an organization-level continuance, usage context particularly from the perspective of organizational and environment settings should be supplemented.

With regard to organizational factors, organizational structure is one of the most commonly studied organizational aspects in the innovation or IS adoption literature (see Damanpour 1992 for a detailed meta-analysis) and it specifies how business activities, such as task allocation, coordination and supervision are directed toward the achievement of organizational business purposes. Moreover, how information flows between levels within an organization is also determined by organization structure. It is therefore believed that a firm with a complicated organizational structure is likely to have a higher willingness to improve current business activities and information flows and thus to adopt E2.0. The complexity of an organizational structure usually involves two dimensions, firm scope (i.e., the breadth) and firm size (i.e., the depth). Thus firm scope and firm size are added as two predictors of firm intention to renew E2.0 to capture the influence of organization characteristic factors. In addition, subjective norms refer to the perceived expectation from an individual's key referents to perform the behavior of interest (Ajzen and Madden, 1986; Ajzen, 1991). A large number of studies on individual-level behavior have found support for the significant impact of subjective norms on IS initial adoption (e.g. Liao et al. 2007; Venkatesh et al. 2012). An individual's behavior is considerably influenced by others' opinions on intended behavior, particularly when referents are important to the individual (e.g., family members and intimate friends). It is plausible that such a communication influence resulting from key referents is still prevalent in the E2.0 post-adoption context. It is noted that key partners or collaborators are also important people to the focal firm and the construct, subjective norms, can be regarded as an environmental context factor sometimes. However, this paper focuses on E2.0 applications that are principally designed and developed for internal organizational communications and collaborations between teams and departments, which is little relevant to external communications, such as, business partners. As a result, this study only considers subject norms as an organizational context factor in this research.

Second, environmental context relates to facilitating and inhibiting factors resulting from external circumstances and significant factors include competitive pressure, trading partners' readiness and government policies (Zhu et al., 2003; Al-Qirim, 2006). Consistent with these prior studies, competitive pressure is included into our conceptual model. With the rise of fierce market competition, firms actively look for effective approaches to increase sustainable competitive advantage, such as reducing business costs, improving customer service, and employing knowledge management. As a result, IT innovation (i.e., E2.0 continuance usage in this case) is viewed as an important channel to help firms to achieve the above purposes. As discussed above,

E2.0 applications are lightweight and agile software and mainly work for team communication and collaboration within an organization and the implementation and usage of E2.0 don't involve trading partners and government departments. Therefore, trading partners' readiness and government policies seem to be unrelated to this research context and purpose. Based on the above gaps in the IS continuance model, and the associated theoretical explanation provided, firm size, firm scope, subjective norms, and competitive pressure, are integrated into the IS continuance model in order to tailor it to the E2.0 continuance use context, as shown in Figure 2.

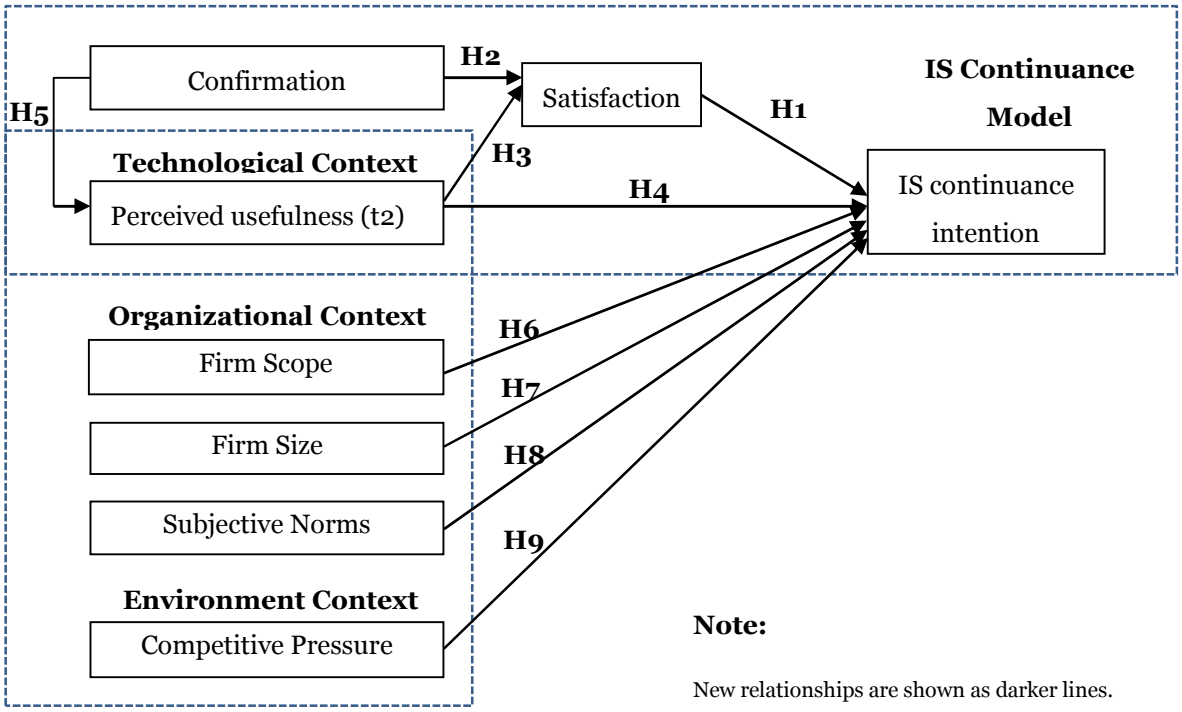



**Figure 2. Research Model**

## 4. Hypothesis Development

This section presents the hypotheses that we incorporate to extend the IS continuance model to the E2.0 continuance use context. Figure 2 shows the original Bhattacherjee's (2001) model and our proposed extensions. Similar to the relationships between perceived usefulness and confirmation, satisfaction and continuance intention developed by Bhattacherjee (2001) in the consumer system acceptance context, it is reasonable that the relationships further apply to the context of enterprise system continuance usage. Hence:

**H1:** A firm's level of satisfaction with initial E2.0 use is positively associated with the firm's E2.0 continuance intention.

**H2:** A firm's extent of confirmation is positively associated with the firm's satisfaction with E2.0 use.

**H3:** A firm's perceived usefulness of E2.0 use is positively associated with the firm's satisfaction with E2.0 use.

**H4:** A firm's IS continuance intention is positively associated with the firm's perceived usefulness of E2.0 use.

**H5:** A firm's extent of confirmation is positively associated with the firm's perceived usefulness of E2.0 use.

### *4.1 Firm scope and firm size*

Firm scope emphasizes the horizontal extent of a firm in terms of business operations (Zhu, 2003) and in this research it is defined as the degree of geographical dispersion of a firm's business activities. Owing to the high heterogeneity of market knowledge, many firms struggle to integrate and exchange market knowledge at a more abstract level, particularly those with multiple business operations departments (Galunic and Rodan, 1998). The more branches a firm has, the more likely the firm is to confront complex difficulties in exchanging market knowledge and best practice between its branches. Prior studies have identified that one of the competitive advantages of using E2.0 is the significant improvement of the effectiveness and efficiency of team collaborations across different regions (McAfee, 2009). For instance, employees can effortlessly and safely exchange and share business data between multiple locations through a Web-based application programming interface (API) of E2.0. Such perceptions of usefulness of E2.0 for increasing competitive advantages are more likely to achieve by a company that uses E2.0 applications in a wider scope of cross-department activities. Consequently:

**H6**: Firm scope is positively associated with a firm's intention to renew E2.0

In addition to firm scope, firm size (i.e., the number of employees) is another important aspect of an organizational structure that significantly determines an enterprise's business performance, such as innovation awareness, resource availability, communication costs, and flexibility (Nord and Tucker, 1987; Fiegenbaum and Karnani, 1991). Following the logic outlined above, it is suggested that the major functions of E2.0 (e.g., reducing internal communications, facilitating project management and motivating information sharing) will be more usefulness for a large-scale firm that has a complex hierarchical structure, owing to the high communication costs and poor efficiency of team collaboration across various departments. Zhu and Kraemer (2005) argue that "size is often associated with inertia; that is, large firms tend to be less agile and less flexible than

small firms. The possible structural inertia associated with large firms may slow down organizational usage [of e-business]" (p. 65). This leads to the following hypothesis:

**H7**: Firm size is positively associated with a firm's intention to renew E2.0.

### *4.2 Subjective norms*

Enterprise 2.0 represents an important IT innovation in contemporary firms for improving information flow, which usually involves several aspects including business procedures, employees' work habits and horizontal organizational structures. Such radical improvements are usually accompanied by high failure rates (Panorama Consulting, 2010). An organization's decision-making on IT innovation essentially represents key organizational members' decisions as a whole (e.g., president and CEO). As a rule of thumb, it is a common strategy that members of the management team are likely to acquire important opinions from key referents regarding a significant organizational decision. Key referents may include both internal and external entities, such as shareholders, employees, customers, partners, suppliers, distributors, competitors, government, community, consultants, creditors and investors (Rowley, 1997). In this case, it is suggested that an organization's management team will typically reach an agreement on renewing their E2.0 service. In other words, each senior management member and related managers (e.g., IT managers) will cautiously consider others' opinions on renewing their E2.0 service before making a final decision on supporting or opposing the renewal of E2.0. Thus, it is proposed that subjective norms should influence an organization's behavioral intention to renew E2.0:

**H8**: Subjective norms are positively associated with a firm's intention to renew E2.0

### *4.3 Competitive pressure*

In the innovation context, competitive pressure mainly refers to peer pressure to use an innovative technology (Gatignon and Robertson, 1989). In this research, the construct of competitive pressure refers to the pressure perceived by a firm's leaders that competitors have achieved substantial competitive advantage by using E2.0 (for example, in terms of communication effectiveness and product development processes) (Lin 2014b, Bughin et al., 2010). The more competitive pressure a firm has realized, the more likely the firm is to strengthen competitive advantage by continuing using E2.0. Thus:

**H9:** Competitive pressure is positively associated with a firm's intention to renew E2.0

## 5. Study Design and Methodology

### *5.1 Data collection*

Our target population is current users (i.e., companies) of Mingdao (www.Mingdao.com)—a leading enterprise 2.0 platform in China. The rationale for selecting Mingdao for the research is as follows. First, reports show that China has become the most promising market for the proliferation of E2.0 technologies (Prof Research, 2015; Wang et al., 2014). More and more enterprises in China have high expectations to increase competitive advantage by improving team collaboration and knowledge sharing. Consequently, there are several emerging E2.0 platforms available in China, e.g., Mingdao, Kingdee (www.kdweibo.com) and Tita (www.tita.com). Second, Mingdao offers a 30-day trial period for new customers to access all E2.0 applications without any functional limitations, such as cloud computing-based customer relationship management system (CRM) and an e-procedure management system. As a startup company, Mingdao aggressively launches a series of marketing promotion campaigns to invite potential enterprises to use and assess its E2.0 applications. Through several years of development, Mingdao has become one of the most influential E2.0 platforms in China. Third, a 30-day trial account with all E2.0 applications enables senior managers to assess fully the benefits of E2.0 to their enterprises before deciding to pay license fees to continue using the E2.0 service after the trial accounts expire.

To obtain data for our research, an online survey was carried out through the integrated online survey platform of Mingdao. The URL of our questionnaire was authorized and then sent to all Mingdao's free enterprise customers. The respondents of the survey were limited to a firm's senior management team and IT managers, who are considered as decision makers for renewing enterprise 2.0 in the firm. Specifically, a firm's senior management team and IT managers received a private message from Mingdao's customer manager soliciting their participation in a survey of their intention to consider renewing Mingdao services after their trial accounts expire. The message described our research purpose, provided the URL of the questionnaire. Invalid or suspicious data were removed (e.g., duplicate IP addresses or unreasonable survey completion times). In all, 228 completed responses from 44 firms were received. After 22 invalid responses were deleted, 206 qualified responses were obtained for quantitative analysis. The gender of respondents was broadly even (54.6% male) and educated (75.9% with a degree) (see Table 1). Most of the respondents were 40 years of age or less. Moreover, 38.3% of respondents are from IT-related industries, with a large number from the wholesale and retail trade industries (16.7%). The median annual revenue of respondent organizations was $787,000-$1,570,000. More than 95% enterprises that the respondents work for are SMEs with fewer than 500 employees. To test for nonresponse bias, the demographic characteristics of the respondents in early and late waves of

data collection are compared and there are no significant differences. Different response formats were used in an effort to control common method bias including semantic differential scales, Likert scales, and reversed statements.

**Table 1. Descriptive Statistics of Respondent and Organizations**

| | |
|---|---|
| **Gender** | |
| Male | 54.6% |
| Female | 45.4% |
| **Age** | |
| 18-30 | 52.5% |
| 31-40 | 40.3% |
| 41-50 | 6.4% |
| 50+yrs | 0.8% |
| **Positions** | |
| CEO, General manager | 24.3% |
| CIO, CTO, VP of Information system | 11.2% |
| IS manager, IS planner | 6.3% |
| Other administrators in IS department | 14.7% |
| COO | 5.8% |
| CFO | 8.6% |
| Other administrators in an organization | 29.1% |
| **Education Level** | |
| High school (non-graduate) or below | 1.7% |
| College diploma graduate or equivalent | 22.4% |
| Bachelor's degree or equivalent | 58.3% |
| Master's degree or equivalent | 13.4% |
| Doctoral degree or equivalent | 4.2% |
| **Annual Revenue of Organizations ($)** | |
| <=31,500 | 23.2% |
| 31,500-78,700 | 9.4% |
| 78,700- 157,000 | 8.2% |
| 157,000 -787,000 | 18.7% |
| 787,000-1,570,000 | 17.4% |
| >=1,570,000 | 23.1% |
| **Industry** | |
| Information transmission, software and information technology services | 38.3% |
| Wholesale and retail trade | 16.7% |
| Manufacturing | 8.9% |
| Financial industry | 6.5% |
| Culture, sports and entertainment | 6.4% |
| Education | 5.2% |
| Leasing and business services | 4.3% |
| Accommodation and catering services | 3.3% |
| Building industry | 2.3% |
| Others | 8.1% |
| **Firm Size (the number of employees)** | |
| 1-49 | 54.4% |
| 50-99 | 21.3% |
| 100-199 | 12.2% |
| 200-499 | 7.3% |
| >=500 | 4.8% |
| **Firm Scope (the number of branches)** | |
| 1-5 | 72.6% |
| 6-10 | 16.4% |
| 11-15 | 5.4% |
| 16-20 | 2.6% |
| >20 | 3.0% |

### *5.2 Measurement*

In our research, multi-item scale measurement was employed. Most items in the research model were adapted from prior studies. The final version of the questionnaire contained 21 questions (2 general items and 19 scale items) (see Appendix A). Measurements for the original IS continuance constructs were adapted from Bhattacherjee (2001), including a reverse-coded item. Following prior studies, firm size is measured based on the number of employees, while firm scope refers to the number of branches that a company has established (Thong, 1999; Zhu, 2003; Gibbs and Kraemer, 2004; Zhu and Kraemer, 2005). Competitive pressure includes three items that were adapted from Zhu et al. (2006a and 2006b). To measure subjective norms, three items were adopted from Venkatesh et al. (2003), but modified for our context. Satisfaction was measured using 7-point semantic differential items. All other scale items were scored on a 7-point Likert scale with a score of 7 indicating 'strongly agree' and a score of 1 indicating 'strongly disagree'. Several

tasks are conducted to address the potential threat of common method bias. First, Harman's one-factor test was performed by entering all of the principal constructs into a principal components factor analysis (Podsakoff and Organ, 1986). Four factors were produced, the first accounted for 38% of the variance. This suggests that there is unlikely to be significant common method bias. Next, following the recommendation of Podsakoff et al. (2003), a single-method factor test in PLS was carried out by using indicators that measured both their theoretical constructs and a common method latent construct, and by re-running the structural model. The results did not change, again suggesting that common method bias was not an issue in our data.

## 6. Data Analysis and Results

### *6.1 Convergent Validity and Reliability*

For multiple item scales, three metrics were used to test convergent validity and reliability: average variance extracted (AVE), Cronbach's alpha and composite reliability (CR). As shown in Table 2, all of the AVE and CR values for constructs were satisfactory, with composite reliabilities at 0.889 or more and AVE values at 0.727 and above (Chin, 1998). Further, as suggested by Nunnally (1978), Cronbach's alpha values are higher than 0.70. Thus, the measurement items that we used converged on the same latent construct and demonstrated internal consistency.

**Table 2. Convergent validity and reliability measurement**

| Construct | AVE | Composite reliability | Cronbach's alpha |
|---|---|---|---|
| Intention to renew E2.0 (IN) | 0.858 | 0.948 | 0.917 |
| Satisfaction (S) | 0.874 | 0.965 | 0.952 |
| Confirmation(C) | 0.842 | 0.941 | 0.906 |
| Perceived usefulness (PU) | 0.908 | 0.967 | 0.949 |
| Subjective norms (SN) | 0.820 | 0.932 | 0.891 |
| Competitive pressure (CP) | 0.727 | 0.889 | 0.812 |

### *6.2 Discriminant Validity*

To assess discriminant validity, the techniques of Fornell and Larcker (1981), Chin (1998) and Henseler (2015) were used. First, a matrix of correlations between constructs with reflective measures was developed. The diagonal was replaced with the square root of the AVE (see Table 3 below) and it is found that the square-root of AVE for each construct was higher than the elements off the diagonal. Second, discriminant validity was assessed by making a comparison

between the loadings of items for an associated construct and their cross-loading on other constructs. For our model, all items loaded on their corresponding constructs more strongly than on other constructs (as seen in Table 4 below). Third, the heterotrait-monotrait ratio of correlations (HTMT), a new approach to assessing discriminant validity in variance-based SEM suggested by Henseler (2015) was used. It is found that all HTMT values were below the 0.90 threshold (see Table 5). To further test for multicollinearity, variance inflation factors (VIFs) was computed. All VIFs were found to be less than the conservative threshold of 5, suggesting that multicollinearity is not a major issue in our data. Overall, there is strong empirical support for the discriminant validity of the constructs in our research model.

**Table 3. Correlations between constructs (square root of AVE on diagonal)**

| | **IN** | **S** | **C** | **PU** | **SN** | **CP** |
|---|---|---|---|---|---|---|
| **IN** | **0.926** | | | | | |
| **S** | 0.449 | **0.935** | | | | |
| **C** | 0.211 | 0.486 | **0.917** | | | |
| **PU** | 0.481 | 0.484 | 0.463 | **0.953** | | |
| **SN** | 0.424 | 0.243 | 0.160 | 0.276 | **0.906** | |
| **CP** | 0.375 | 0.183 | 0.059 | 0.243 | 0.192 | **0.853** |

**Table 4. Loadings and cross-loadings**

| | IN | S | C | PU | SN | CP |
|---|---|---|---|---|---|---|
| IN1 | **0.942** | 0.436 | 0.201 | 0.458 | 0.362 | 0.330 |
| IN2 | **0.936** | 0.407 | 0.203 | 0.465 | 0.355 | 0.354 |
| IN3 | **0.899** | 0.403 | 0.183 | 0.414 | 0.460 | 0.358 |
| S1 | 0.397 | **0.916** | 0.42 | 0.442 | 0.234 | 0.165 |
| S2 | 0.396 | **0.946** | 0.495 | 0.463 | 0.209 | 0.162 |
| S3 | 0.456 | **0.939** | 0.469 | 0.457 | 0.226 | 0.210 |
| S4 | 0.426 | **0.938** | 0.427 | 0.446 | 0.241 | 0.146 |
| C1 | 0.142 | 0.422 | **0.924** | 0.416 | 0.097 | 0.061 |
| C2 | 0.183 | 0.456 | **0.917** | 0.409 | 0.163 | 0.050 |
| C3 | 0.252 | 0.457 | **0.912** | 0.446 | 0.177 | 0.052 |
| PU1 | 0.391 | 0.411 | 0.455 | **0.941** | 0.262 | 0.197 |
| PU2 | 0.483 | 0.471 | 0.425 | **0.956** | 0.227 | 0.250 |
| PU3 | 0.494 | 0.496 | 0.444 | **0.962** | 0.299 | 0.244 |
| SN1 | 0.372 | 0.198 | 0.109 | 0.190 | **0.903** | 0.142 |
| SN2 | 0.407 | 0.190 | 0.122 | 0.254 | **0.908** | 0.201 |
| SN3 | 0.372 | 0.276 | 0.206 | 0.306 | **0.906** | 0.178 |
| CP1 | 0.345 | 0.165 | 0.039 | 0.207 | 0.180 | **0.882** |
| CP2 | 0.319 | 0.135 | 0.063 | 0.240 | 0.212 | **0.876** |
| CP3 | 0.293 | 0.170 | 0.051 | 0.173 | 0.094 | **0.797** |

**Table 5. Heterotrait-monotrait ratio (HTMT)**

| | IN | S | C | PU | SN | CP |
|---|---|---|---|---|---|---|
| **IN** | | | | | | |
| **S** | **0.480** | | | | | |
| **C** | 0.230 | **0.521** | | | | |
| **PU** | 0.514 | 0.507 | **0.499** | | | |
| **SN** | 0.468 | 0.266 | 0.178 | **0.300** | | |
| **CP** | 0.434 | 0.209 | 0.07 | 0.275 | **0.222** | |

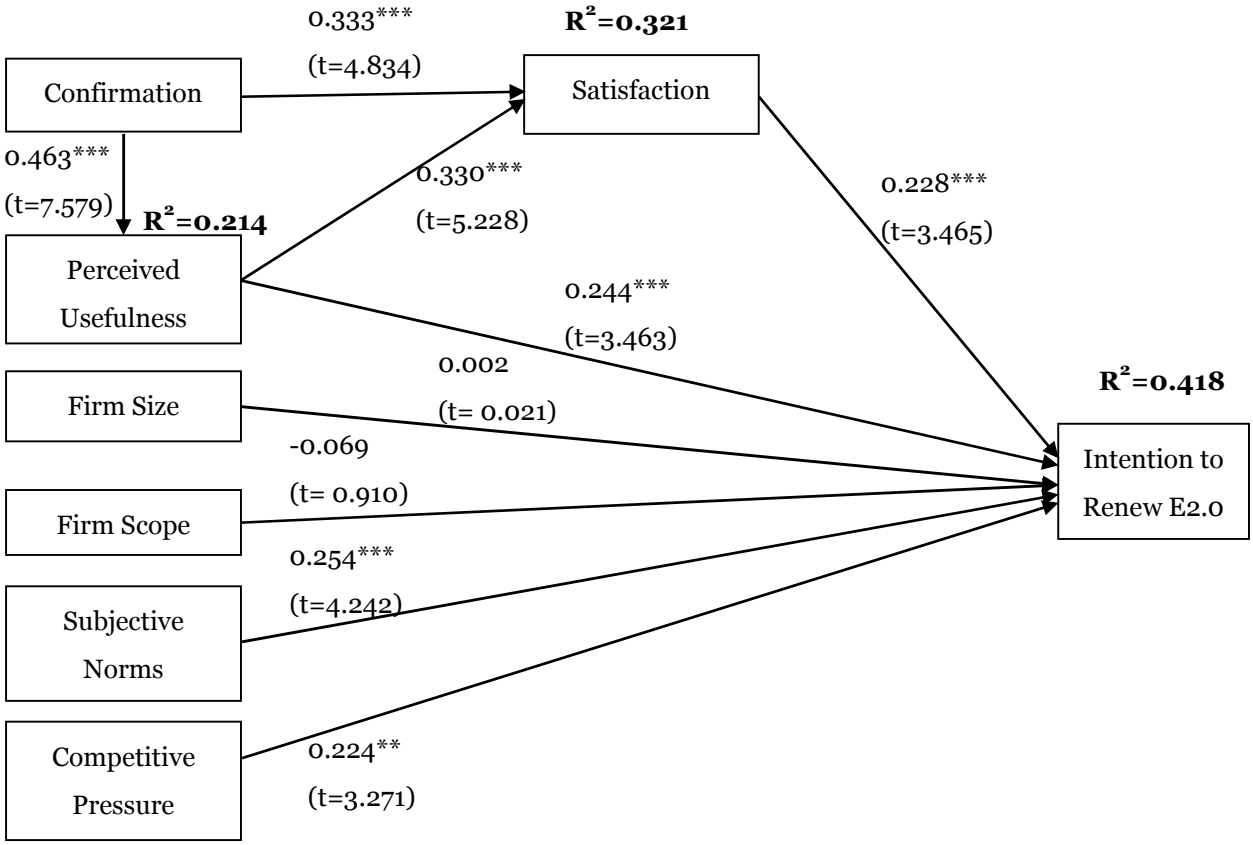
### *6.3 Hypotheses Testing*

Our proposed model and the hypothesized relationships among constructs were evaluated by using SEM-PLS modeling in SmartPLS 3.0M because the goal of this paper is to identity key constructs that influence the continuance usage of E2.0 rather than to carry out theory testing, theory confirmation, or the comparison of alternative theories. Moreover, our sample did not fully follow a multivariate normal distribution, which is required by covariance-based SEM (CBSEM) methods, as exemplified by software such as LISREL, AMOS, and EQS (Hair et al., 2014).

Overall, the results support seven of the nine hypotheses posited. Figure 2 shows the standardized path coefficients and path significances as reported by SmartPLS. T-statistics and path significance levels for each of the hypothesized relationships were computed by using the bootstrapping method. Path coefficients and R2 values were obtained by running the PLS algorithm to assess the predictive performance of the structural model. The construct for intention had an R2 value of 0.418, indicating that more than 41% of the intention to renew E2.0 services was explained by the respondents' perceptions of benefits, subjective norms, and leaders' support. Overall, the empirical results strongly supported the explanatory power of our research model for enterprises' intentions to renew E2.0.

Let us considered the individual hypotheses in turn. Specifically, despite a slight decrease in path coefficients, the relationships of the IS continuance model are still significant at the 0.1% level (i.e., H1-H5). Two firm characteristics, firm size and firm scope, showed little impact on intention to renew E2.0 services (H6 and H7 were not supported), and the path between subjective norms and intention to renew E2.0 was strongly supported ($\beta$ = 0.254, t=4.242), as proposed by H8. Furthermore, our data did support the path between competitive pressure and continuance intention (i.e., H9 is supported). It appears that an enterprise's intention to renew E2.0 services is significantly driven by external pressure, which is consistent with prior studies on general IS adoption, including those on e-business adoption and assimilation (Teo et al. 2006). An organization is more likely to continue using E2.0 in case the organization recognizes that more

and more competitors in the same industry have increased competitive advantages and developed marketing dynamic capabilities through the continuance usage of E2.0 (Soares-Aguiar and Palma-Dos-Reis, 2008; Dimaggio and Powell, 1991).




Note: * denotes p<0.05 ** denotes p<0.01 and *** denotes p<0.001

**Figure 3. Research model with empirical results**

## 7. Discussions and Conclusions

The results of our analysis provide valuable findings for theory and practice. Our study is arguably one of the first attempts to develop a theoretical model of E2.0 continuance usage. More than 41% of the variance in an organization's intention to renew E2.0 services can be explained through our theoretical model. Overall, the statistical tests provided good support for our research model. Let us further examine the theoretical and practical contributions of the research, along with possible limitations.

### *7.1 Theoretical Contributions*

This paper contributes to the emerging stream of literature that investigates the prevalence of social network applications. A significant amount of past research has investigated the initial adoption

and continuance implementation of Web 2.0 (e.g., Facebook, Blog and Twitter), including in the personal usage context, such as students (e.g., Cheung et al. 2011; Chen et al. 2012; Fan et al. 2016; Lai et al. 2016), and in an organizational context, such as governments and libraries (e.g., Husin et al, 2016; Kolb and Thach 2016; Al-Kharousi et al. 2016; Mukkamala and Razmerita 2014; Barron and Schneckenberg 2012). For instance, Husin et al (2015) focus on identifying factors that hinder Web 2.0 implementation within a government organization and examine the effective usage of Web 2.0 among government employees. Recent studies (e.g., Wang et al., 2014; Lin et al., 2010; Antonius et al. 2015; Alqahtani et al. 2015) have begun to examine the significant factors leading to the initial adoption of social network software in the organizational context by shifting the emphasis from Web2.0 to Enterprise 2.0. Following the extant literature, this paper extends the generalizability of prior studies on Enterprise 2.0 from initial adoption to continuance usage. Consequently, our major theoretical contribution is in modifying the IS continuance model for the enterprise-level technology continuance use context. In the case of firms' continuance adoption of technology, other drivers come to the fore. Two such drivers included in our research model are subjective norms and competitive pressure.

Subjective norms was found to be a more important driver than satisfaction and perceived usefulness in non-individual IS continuance usage contexts. Unlike personal decision-making on IS continuance usage (e.g., Facebook), a firm's decision-making on enterprise system continuance usage has a considerable impact on the firm performance and survival and thus represents the final decision of management team as a whole. Such a final decision is not only influenced by individuals' cognitive beliefs and affect (e.g., CEO's perception of usefulness and satisfaction), but also more importantly is determined by a majority opinion expressing the view shared by more than half of management team members. Our research findings suggest that if most senior managers of a firm are likely to continue using E2.0, CEO normally respect their opinions on renewing E2.0 service even though he or she doesn't fully realize the usefulness of E2.0 during a trial period. Thus, the significance of subjective norms in the enterprise system continuance usage context is highlighted.

This study integrates competitive pressure into the IS continuance model to capture the influence of competitors that have used emerging IS in the enterprise system continuance usage context. While the extant literature has examined the role of competitive pressure in initial adoption of firm-level IS (e.g., Pan and Jang, 2008; Lin, 2104a and 2014b), this study extends it to continued use. Future research may build on our study to further examine how different pricing strategies can influence firm intention to continue using the focal E2.0 software, such as decoy pricing vs. freemium. Another major theoretical contribution of this work is the empirical investigation of the role of leaders in determining firm-level IS continuance. 206 managers from 44 firms offer

valuable opinions to our research. More and more contemporary companies are trying to build a "flat" organizational structure with few hierarchical levels and looser boundaries through E2.0 platforms. However, the free-to-paid user conversion rate of E2.0 platforms is still low. Even for the biggest Enterprise 2.0 platform, Yammer, the average conversion rate from free trials to paid users is only 15%. IS researchers should pay particular attention to examining factors that influence E2.0 continuance usage from the perspective of a company's management team. This hitherto under-researched form of leaders' support, peer influence and their subjective assessment of the benefits of paid E2.0 continuance usage could result in important research contributions.

In sum, in contrast to prior social network studies that mainly focus on examining factors relating to a user's subjective evaluation of the expectation-performance discrepancy introduced from the ECT (Oliver, 1980) and its derived theories (e.g., Bhattacherjee, 2001), this study introduced three organizational context factors and one external environment factor to explain behavior. Our research findings show that subjective norms and competitive pressure have a significant impact on IS continuance behavior in the enterprise system context. Our study helps to enrich the IS post-adoption literature in an enterprise-level purchase setting, particularly from the perspective of enterprise leaders. Such a theoretical contribution is of great significance given the fact that most E2.0 platforms are facing a significant challenge in improving their free-to-paid user conversion rate. This research provides a complementary perspective to current theoretical models of IS continuance to provide a better understanding of enterprise-level IS purchase behavior.

### *7.2 Practical Implications*

Practitioners who develop E2.0 platforms for contemporary companies should be aware of the importance of management team as a whole in facilitating the implementation of E2.0, particularly in the SME context. Particularly, our study suggests that subjective norms over perceived usefulness of IT applications can influence E2.0 continuance use. As a consequence, E2.0 developers should actively demonstrate and promote successful E2.0 usage cases as a way to enhance enterprise leaders' recognition of the benefits of E2.0 services. In addition, a series of E2.0 training courses should be freely available, which will help company leaders to understand how to utilize effectively E2.0 applications for improving their business activities.

The findings show that perceived usefulness is important for E2.0 continuance usage. Perceived usefulness are of course one of the fundamental objectives of enterprises when they consider purchasing E2.0 services. It is suggested that E2.0 developers should consider this in attempts to demonstrate explicitly the advantages of E2.0. For example, one idea is to develop some measurable indices of business performance, such as office automation efficiency or reduction in

communication costs that help enterprises to compare their business performance between pre- and post-E2.0 implementation.

### *7.3 Limitations*

Our study is not without its limitations. The first is about the generalizability of our findings. The target respondents in our investigation are users of Mingdao, which mainly comprises of SMEs. It is believed that the results may be somewhat different if data is collected from an E2.0 platform where the majority of users are large companies. Second, leaders' opinions in this study are only collected from a single, leading, Chinese E2.0 platform – Mingdao. Generalizing our research findings to other E2.0 platforms should consider the different characteristics of such platforms. Third, related to the points mentioned previously and the nature of the customer base, an examination of the influence of firm characteristics may be considered limited, thus limiting the effect of an examination of firm size and scope. Finally, the study was conducted in China and our findings must be considered in that context: a "high-context" culture in which communicators are likely to carry out implicit communication in organizations, which may limit the formation of the habit of using E2.0. Our research findings may not apply to other countries with a different ("low-context") culture. Future research should be encouraged to build on our study by examining the influence of habit on E2.0 continuance usage in different regions and countries.

## References


Ajjan, H., & Hartshorne, R. (2008). Investigating Faculty Decisions to Adopt Web 2.0 Technologies: Theory & Empirical Tests. *The Internet & Higher Education 11* (2), 71-80.

Ajzen, I., & Fishbein, M. (1980). *Understanding Attitudes & Predicting Social Behavior*. Englewood Cliff, NJ: Prentice-Hall

Ajzen, I., & Madden, T. J. (1986). Prediction of Goal-Directed Behavior: Attitudes, Intentions, & Perceived Behavioral Control. *Journal of Experimental Social Psychology 22* (5), 453-474.

Ajzen, I. (1991). The Theory of Planned Behavior. *Organizational Behavior & Human Decision Processes 50* (2), 179-211.

Al-Kharousi, R., Jabur, N. H., Bouazza, A., & Al-Harrasi, N. (2016). Factors Affecting the Implementation of Web 2.0 Applications in Omani Academic Libraries. *The Electronic Library*, 34(2), 332-351.

Alqahtani, F., Watson, J., & Partridge, H. (2014). Organizational Support and Enterprise Web 2.0 Adoption: A Qualitative Study. *in Proceedings of the 20th Americas Conference on Information Systems, Savannah*, USA

Alqahtani, F. H., & Alwadainm A. S. (2015). Strategy as a Prerequisite of Enterprise Web 2.0 Implementation *in Proceedings of the 12th International Conference on Information Technology: New Generations (ITNG)*, 736-739. Las Vegas.

Antonius, Nicky, Jun Xu, & Xiangzhu Gao. (2015) Factors Influencing the Adoption Of Enterprise Social Software In Australia. *Knowledge-Based Systems*, 73, 32-43.

Barron, A., & Schneckenberg, D. (2012). A Theoretical Framework for Exploring the Influence of National Culture On Web 2.0 Adoption in Corporate Contexts. *Electronic Journal of Information Systems Evaluation*, 15(2), 176-186.

Bhattacherjee, A. (2001). Understanding Information Systems Continuance: An Expectation-Confirmation Model. *MIS Quarterly 25*(3), 351-370.

Boulos, M. N., Maramba, I., & Wheeler, S. (2006). Wikis, Blogs & Podcasts: A New Generation of Web-Based Tools for Virtual Collaborative Clinical Practice & Education. *BMC Medical Education 6* (1), 41.

Bruno, A., Marra, P., & Mangia, L. (2011). The Enterprise 2.0 Adoption Process: A Participatory Design Approach. *In Proceedings of the 13th International Conference on Advanced Communication Technology (ICACT)*, 1457-1461. Phoenix Park.

Chau, P. Y. & Tam. K.Y. (1997). Factors Affecting the Adoption of Open Systems: An Exploratory Study. *MIS Quarterly 21* (1), 1-24.

Chen, S. C., Yen, D. C., & Hwang, M. I. (2012). Factors Influencing the Continuance Intention to the Usage of Web 2.0: An Empirical Study. *Computers in Human Behavior*, *28*(3), 933-941.

Chou, S. W., & Chen, P.Y. (2009. The Influence of Individual Differences on Continuance Intentions of Enterprise Resource Planning (ERP). *International Journal of Human-Computer Studies 67* (6), 484-496.

Chua, A. Y. K., & Goh, D. H. (2010). A Study of Web 2.0 Applications in Library Websites. *Library Information Science Research 32* (3), 203-211.

Cheung, C. M. K., Chiu, P. Y., & Lee, M. K. O. (2011). Online Social Networks: Why Do Students Use Facebook? *Computers in Human Behavior*, *27*(4), 1337–1343.

Cooper, R. B., & Zmud. R. W. (1990). Information Technology Implementation Research: A Technological Diffusion Approach. *Management Science 36* (2), 123-139.

Cristina D. P., & Jesús-Nicasio G.S. (2016). Psychological profiles of older adult Web 2.0 tool users. *Computers in Human Behavior* 64 (11), 673-681.

Damanpour, F. (1992). Organizational Size & Innovation. *Organization Studies 13* (3), 375-402.

Davis, F. D. (1989). Perceived Usefulness, Perceived Ease of Use, & User Acceptance of Information Technology. *MIS Quarterly. 13* (3), 319-340.

Dawson, R., Hough, J. Hill, J. Winterford, B. & Alexandrov, D. (2009). Implementing Enterprise 2.0, a Practical Guide to Creating Business Value with Web Technologies. Advanced Human Technologies, Sydney.

DiMaggio, P. J., & Powell. W. W. (1991). The New Institutionalism in Organizational Analysis (Vol. 17). Chicago, IL: University of Chicago Press.

Fan, S., Radford, J., & Fabian, D. (2016). A Mixed-Method Research to Investigate the Adoption of Mobile Devices and Web2. 0 Technologies Among Medical Students and Educators. *BMC Medical Informatics and Decision Making*, 16(1), 1.

Fiegenbaum, A., & Karnani. A. (1991). Advantage for Small Firms. *Strategic Management Journal 12* (2), 101-114.

Fishbein, M., & Ajzen, I. (1975). Belief, Attitude, Intention & Behavior: An Introduction to Theory & Research. Reading, MA: Addison-Wesley.

Fornell, C., & Larcker, F.D. (1981). Evaluating Structural Equation Models with Unobservable Variables & Measurement Error. *Journal of Marketing Research 18* (1), 39–50.

Galliers, R.D. (2007). Organizational Dynamics of Technology-Based Innovation. In Organizational Dynamics of Technology-Based Innovation: Diversifying the Research Agenda, edited by McMaster, T., D. Wastell, E. Ferneley, & J. DeGross, 15-18. New York: Springer/IFIP.

Galunic, D.C., & Rodan. S. (1998). Resource Recombination in the Firm: Knowledge Structures & the Potential for Schumpeterian Innovation. *Strategic Management Journal 19* (12), 1193–1201.

Gatignon, H., & Robertson. T.S. (1989. Technology Diffusion: An Empirical Test of Competitive Effects. *Journal of Marketing 53* (1), 35-49.

Gibbs, J. L., & Kraemer. K. L. (2004). A Cross-Country Investigation of the Determinants of Scope of E-Commerce Use: An Institutional Approach. *Electronic Markets 14* (2), 124-137.

Hair, J.F., Hult, G.M.T., Ringle, C.M., & Sarstedt, M. (2014). A Primer on Partial Least Squares Structural Equation Modeling (PLS-SEM). Sage: Thous& Oaks.

Hsu, P.F., Kraemer, K.L., & Dunkle, D., (2006). Determinants of E-Business Use in US Firms. *International Journal of Electronic Commerce 10* (4), 9-45.

Husin, M. H., Evans, N., & Deegan, G. (2016). Achieving Adoption and Effective Usage of Web 2.0 Among Employees Within Australian Government Organizations. *Journal of Systems and Information Technology*, 18(1), 41-63.

Henseler, J., Ringle, C.M., & Sarstedt, M., (2015). A New Criterion for Assessing Discriminant Validity in Variance-based Structural Equation Modeling. *Journal of the Academy of Marketing Science 43* (1), 115-135.

Karahanna, E., & Straub. D. W. (1999). The Psychological Origins of Perceived Usefulness & Ease-Of-Use. *Information & Management 35* (4), 237-250.

Kolb, D., & Thach, L. (2016). Analyzing German Winery Adoption of Web 2.0 and Social Media. *Journal of Wine Research,* 27(3), 226-241.

Kuan, K. K. & Chau. P. Y. (2001). A Perception-Based Model for EDI Adoption in Small Businesses Using a Technology–Organization–Environment Framework. *Information & Management 38* (8), 507-521.

Kuettner, T., Diehl, R., & Schubert, P. (2013). Change Factors in Enterprise 2.0 Initiatives: Can We Learn from ERP? *Electronic Markets 23* (4), 329-340.

Kurz, M., & Fleischmann, A. (2011). BPM 2.0: Business Process Management Meets Empowerment. In Subject-Oriented Business Process Management, edited by Fleischmann, A., W. Schmidt, R. Singer & D. Seese, 54-83. Heidelberg: Springer.

Lai, H. J. (2016). Examining Civil Servants' Decisions to Use Web 2.0 Tools for Learning, Based On the Decomposed Theory of Planned Behavior. *Interactive Learning Environments*, 1-11.

Lee, O.K.D., Wang, M.W., Lim, K.H., & Peng, Z.J. (2009). Knowledge Management Systems Diffusion in Chinese Enterprises: A Multistage Approach Using the Technology-Organization-Environment Framework. *Journal of Global Information Management 17* (1) ,70.

Leonardi, P.M., Huysman, M., & Steinfield, C. (2013). Enterprise Social Media: Definition, History, & Prospects for the Study of Social Technologies in Organizations. *Journal of Computer-Mediated Communication 19* (1), 1-19.

Levy, M. (2009). WEB 2.0 Implications on Knowledge Management. *Journal of Knowledge Management 13* (1), 120-134.

Liao, C., Chen, J. L., & Yen, D. C. (2007). Theory of Planning Behavior (TPB) & Customer Satisfaction in the Continued Use of E-Service. An Integrated Model. *Computers in Human Behavior*, *23*(6), 2804–2822.

Lin, H. F. (2014a). Contextual Factors Affecting Knowledge Management Diffusion in SMEs. *Industrial Management Data Systems 114* (9), 1415-1437.

Lin, H. F. (2014b). Understanding the Determinants of Electronic Supply Chain Management System Adoption: Using the Technology–Organization–Environment Framework. *Technological Forecasting & Social Change 86*: 80-92.

Lin, T.C., Lee, C.K., & Lin, J.C.C. (2010). Determinants of Enterprise 2.0 adoption: A value-based adoption model approach. *In Proceedings of the 2010 International Conference on Information Society (i-Society)*, 12-18. Piscataway, NJ:IEEE.

Lin, W. S. (2012). Perceived Fit & Satisfaction on Web Learning Performance: IS Continuance Intention & Task-Technology Fit Perspectives. *International Journal of Human-Computer Studies 70* (7), 498-507.

Lin, J. S. C., & Hsieh, P. L. (2007). The Influence of Technology Readiness on Satisfaction & Behavioral Intentions toward Self-Service Technologies. *Computers in Human Behavior*, *23*(3), 1597–1615

Louw, R., & Mtsweni, J. (2013). Guiding Principles for Adopting & Promoting Enterprise 2.0 Collaboration Technologies. *In Proceedings of the 2013 International Conference on Adaptive Science & Technology (ICAST)*, 1-6. Piscataway, NJ: IEEE.

Mangiuc, D. M. (2011). Enterprise 2.0: Is the Market Ready? *Journal of Accounting & Management Information Systems 10* (4), 516-534.

McAfee, A. P. (2006). Enterprise 2.0: The Dawn of Emergent Collaboration. *MIT Sloan Management Review 47* (3), 21-28.

McAfee, A. (2009). *Enterprise 2.0: New Collaborative Tools for Your Organization's Toughest Challenges*. Boston: Harvard Business Press.

Miles, D. (2009). *Collaboration & Enterprise 2.0: Work-Meets-Play or The Future of Business*. AIIM Industry Watch Report. AIIM, MD: Silver Spring.

Mukkamala, A. M., & Razmerita, L. (2014). Which Factors Influence the Adoption of Social Software? An Exploratory Study of Indian Information Technology Consultancy Firms. *Journal of Global Information Technology Management*, 17(3), 188-212.

Nord, W. R., & Tucker. S. (1987). *Implementing Routine & Radical Innovations. Lexington*, MA: Lexington Books.

Oliver, R. L. (1980). A Cognitive Model of the Antecedents & Consequences of Satisfaction Decisions. *Journal of Marketing Research 17* (4), 460-469.

Oliveira, T., & Martins. M. F. (2011). Literature Review of Information Technology Adoption Models at Firm Level. *The Electronic Journal Information Systems Evaluation*. *14* (1), 110-121.

O'Reilly, T. (2006). What is Web 2.0? Accessed 5th Sep 2015. http://www.oreillynet.com/pub/a/oreilly/tim/news/2005/09/30/what-is-web-20.html

Pan, M., & Jang. W. (2008). Determinants of the Adoption of Enterprise Resource Planning Within the Technology-Organization-Environment Framework: Taiwan's Communications. *Journal of Computer Information Systems 48* (3), 94-102.

Panorama Consulting Group. (2010). 2010 ERP Report. http://panoramaconsulting.com/resource-center/2010-erp-report/

Paroutis, S. & Saleh. A. A. (2009). Determinants of Knowledge Sharing Using Web 2.0 Technologies. *Journal of Knowledge Management 13* (4), 52-63.

Podsakoff, P. M., & Organ. D.W. (1986. Self-Reports in Organizational Research: Problems & Prospects. *Journal of Management 12* (4), 531–544.

Prof Research Global & Chinese Enterprise 2.0 Industry. (2015). 2009-2019 Market Research Report. http://www.psresearchreports.com/research/enterprise-2.0-industry

Research & Markets. (2013). Enterprise 2.0 Market 2012-2016. http://www.businesswire.com/news/home/20130118005667/en/Research-Markets-Global-Enterprise-2.0-Market-2012-2016

Roca C.J., Chiu, C.M. & Martínez, F.J. (2006). Understanding E-Learning Continuance Intention: An Extension of the Technology Acceptance Model. *International Journal of Human-Computer Studies 64* (8), 683-696.

Rowley, T. J., (1997). Moving Beyond Dyadic Ties: A Network Theory of Stakeholder Influences. *Academy of Management Review 22* (4), 887-910.

Shin, D. H. (2010). Analysis of online Social Networks: A Cross-national Study. *Online Information Review 34* (3), 473-495.

Soares-Aguiar, A., & Palma-dos-Reis, A. (2008). Why Do Firms Adopt E-Procurement Systems? Using Logistic Regression to Empirically Test a Conceptual Model. *IEEE Transactions on Engineering Management 55* (1), 120-133.

Teo, T. S., Ranganathan, C., & Dhaliwal, J. (2006). Key Dimensions of Inhibitors for the Deployment of Web-Based Business-To-Business Electronic Commerce. *IEEE Transactions on Engineering Management 53* (3), 395-411.

Thong, J. Y. (1999). An Integrated Model of Information Systems Adoption in Small Businesses. *Journal of Management Information Systems 15* (4), 187-214.

Thong, J.Y.L., Hong, S.J. & Tam, K.Y. (2006). The Effects of Post-Adoption Beliefs on the Expectation-Confirmation Model for Information Technology Continuance. *International Journal of Human-Computer Studies 64* (9), 799-810.

Tornatzky, L.G., Fleischer, M., & Chakrabarti, A.K. (1990). *Processes of Technological Innovation*. Lexington: Lexington Books.

Venkatesh, V. & Davis, F. D. (2000). A Theoretical Extension of the Technology Acceptance Model: Four Longitudinal Field Studies. *Management Science 46* (2), 186-204.

Venkatesh, V., Morris, M.G., Davis, G. B., & Davis, F. D. (2003). User Acceptance of Information Technology: Toward a Unified View. *MIS Quarterly 27* (3), 425-478.

Venkatesh, V., Thong, J.Y., & Xu, X. (2012). Consumer Acceptance & Use of Information Technology: Extending the Unified Theory of Acceptance & Use of Technology. *MIS Quarterly 36* (1), 157-178.

Wang, T., Jung, C.H., Kang, M.H., & Chung, Y.S. (2014). Exploring Determinants of Adoption Intentions towards Enterprise 2.0 Applications: An Empirical Study. *Behavior & Information Technology 33* (10), 1048-1064.

Yang Z.J., Sun J., Zhang Y.L., & Wang Y. (2015) Understanding SaaS adoption from the perspective of organizational users: A tripod readiness model. Computers in Human Behavior.45, 254-264.

Yoon, C., & Roll E. (2015). Understanding Continuance Use in Social Networking Services. *Journal of Computer Information Systems 55* (2), 1—8.

Zhao, R.Y., & Chen, B.K. (2013). Study on Enterprise Knowledge Sharing in ESN Perspective: A Chinese Case Study. *Journal of Knowledge Management 17* (3), 416-434.

Zhu, K., Kraemer, K., & Xu, S. (2003). Electronic Business Adoption by European Firms: A Cross-Country Assessment of the Facilitators & Inhibitors. *European Journal of Information Systems 12* (4), 251-268.

Zhu, K., & Kraemer, K. L. (2005). Post-adoption Variations in Usage & Value of E-Business by Organizations: Cross-Country Evidence from the Retail Industry. *Information Systems Research 16* (1), 61-84.

Zhu, K., Dong, S., Xu, S. X., & Kraemer, K. L. (2006a). Innovation diffusion in global contexts: determinants of post-adoption digital transformation of European companies. European journal of information systems, 15(6), 601-616.

Zhu, K., Kraemer, K. L., & Xu, S. (2006b). The Process of Innovation Assimilation by Firms in Different Countries: A Technology Diffusion Perspective on E-Business. *Management Science 52* (10), 1557-1576.

**Appendix A: Survey Instrument**

| Construct | Items | Sources |
|---|---|---|
| Intention to renew E2.0 | ***(1=Strongly Disagree to 7=Strongly Agree)***<br>IN1: I intend to continue using Mingdao rather than discontinue its use after the trial account expires.<br>IN2: My intention is to continue using Mingdao rather than use any alternative means.<br>IN3: If I could, I would like to discontinue our use of Mingdao after the trial account expires **(reverse coded).** | Bhattacherjee (2001) |
| Firm Size | What is the number of employees in your organization? | Zhu et al. (2003) |
| Firm Scope | What is the number of establishments (branches) where your organization develops business activities? | Zhu et al. (2003) |
| Subjective Norms | ***(1=Strongly Disagree to 7=Strongly Agree)***<br>SN1: In our firm, people who are important to me think that I should support the continuance use of Mingdao.<br>SN2: In our firm, people who influence me think that I should support the continuance use of Mingdao.<br>SN3 In our firm, colleagues whose opinions I value that I should support the continuance use of Mingdao. | Venkatesh et al. (2003) |
| Perceived Usefulness | ***(1=Strongly Disagree to 7=Strongly Agree)***<br>PU1: Through using Mingdao, I facilitate collaboration and communication.<br>PU2: Through using Mingdao, I improve operational efficiency.<br>PU3: Through using Mingdao, I improve organizational structures. | Bhattacherjee (2001) |

| | | |
|---|---|---|
| Satisfaction | ***How do you feel about your overall experience of Mingdao use to the present time:***<br>S1 Very dissatisfied (1) - Very satisfied (7)<br>S2 Very displeased (1) - Very pleased (7)<br>S3 Very frustrated (1) - Very contented (7)<br>S4 Absolutely terrible (1) - Absolutely delighted (7). | Bhattacherjee (2001) |
| Confirmation | ***(1=Strongly Disagree to 7=Strongly Agree)***<br>C1: My experience with using Mingdao was better than what I expected.<br>C2: The benefits with using Mingdao were better than I expected.<br>C3: Overall, most of my expectations from using Mingdao were confirmed. | Bhattacherjee (2001) |
| Competitive Pressure | ***(1=Strongly Disagree to 7=Strongly Agree)***<br>CP1. More and more competitors in your industry have conducted team collaboration and communication through E2.0<br>CP2. More and more competitors in your industry have conducted knowledge management and sharing though E2.0<br>CP2. More and more competitors in your industry have conducted project management though E2.0 | Zhu et al. (2006) |